

An aerial photograph of the El Cajon Valley area, showing a mix of urban development, agricultural fields, and natural terrain. A conceptual model is overlaid on the map, featuring a central rectangular area with a grid-like pattern, possibly representing a water distribution system or a land use plan. The model includes various colored regions (blue, green, yellow, red) and lines indicating boundaries or flow paths. The title 'El Cajon Valley Site Conceptual Model' is prominently displayed at the top in large white text.

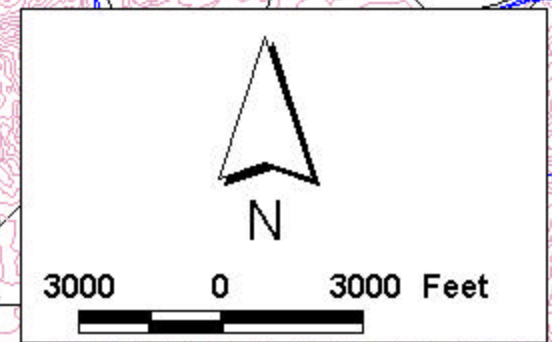
El Cajon Valley Site Conceptual Model

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Tony Sawyer
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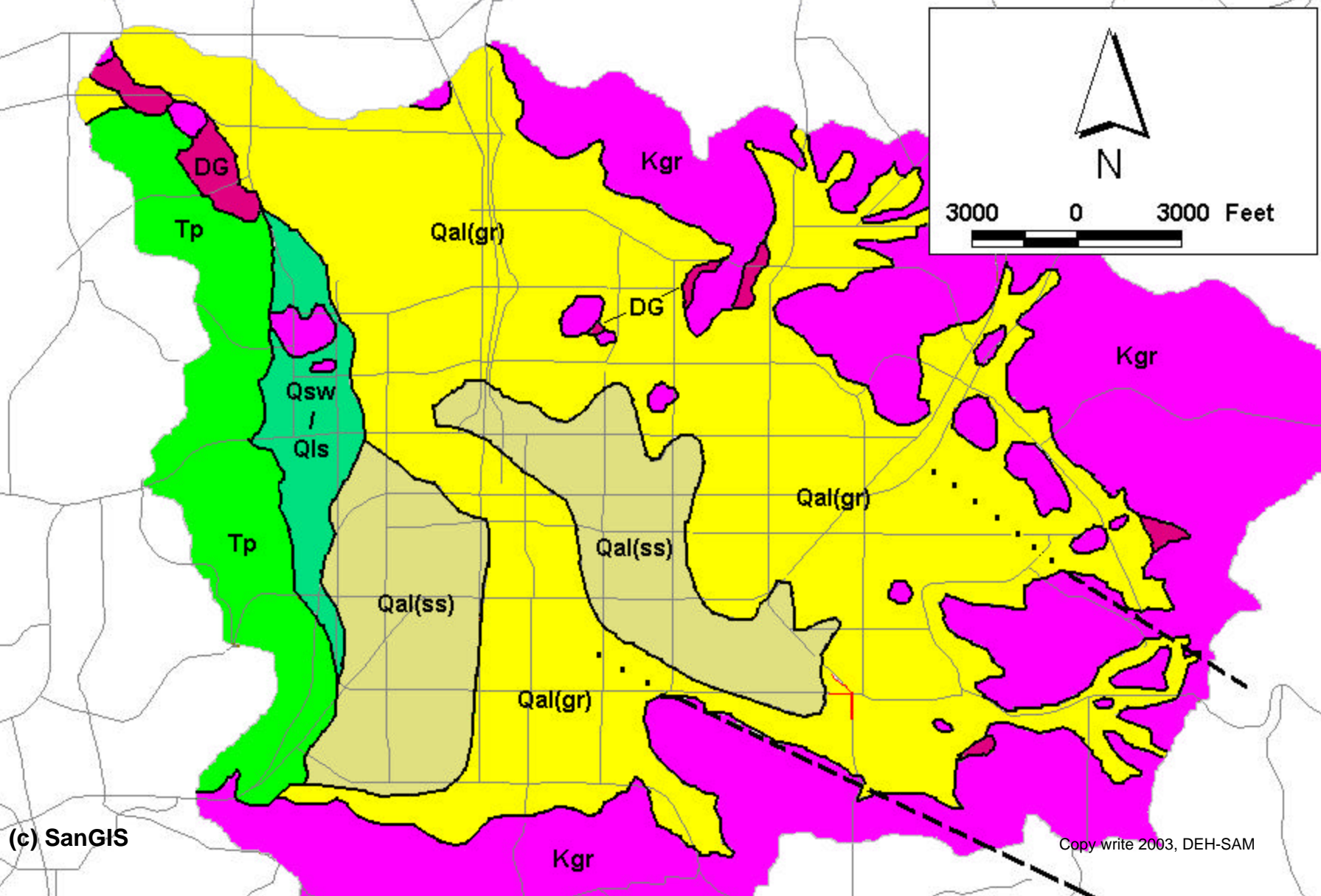
El Cajon Valley SCM

- **Surface Topography**
- **Surface water drainage patterns**
- **Geology**
- **Historic Groundwater Development**
- **Current Groundwater Development**
- **General Observation**

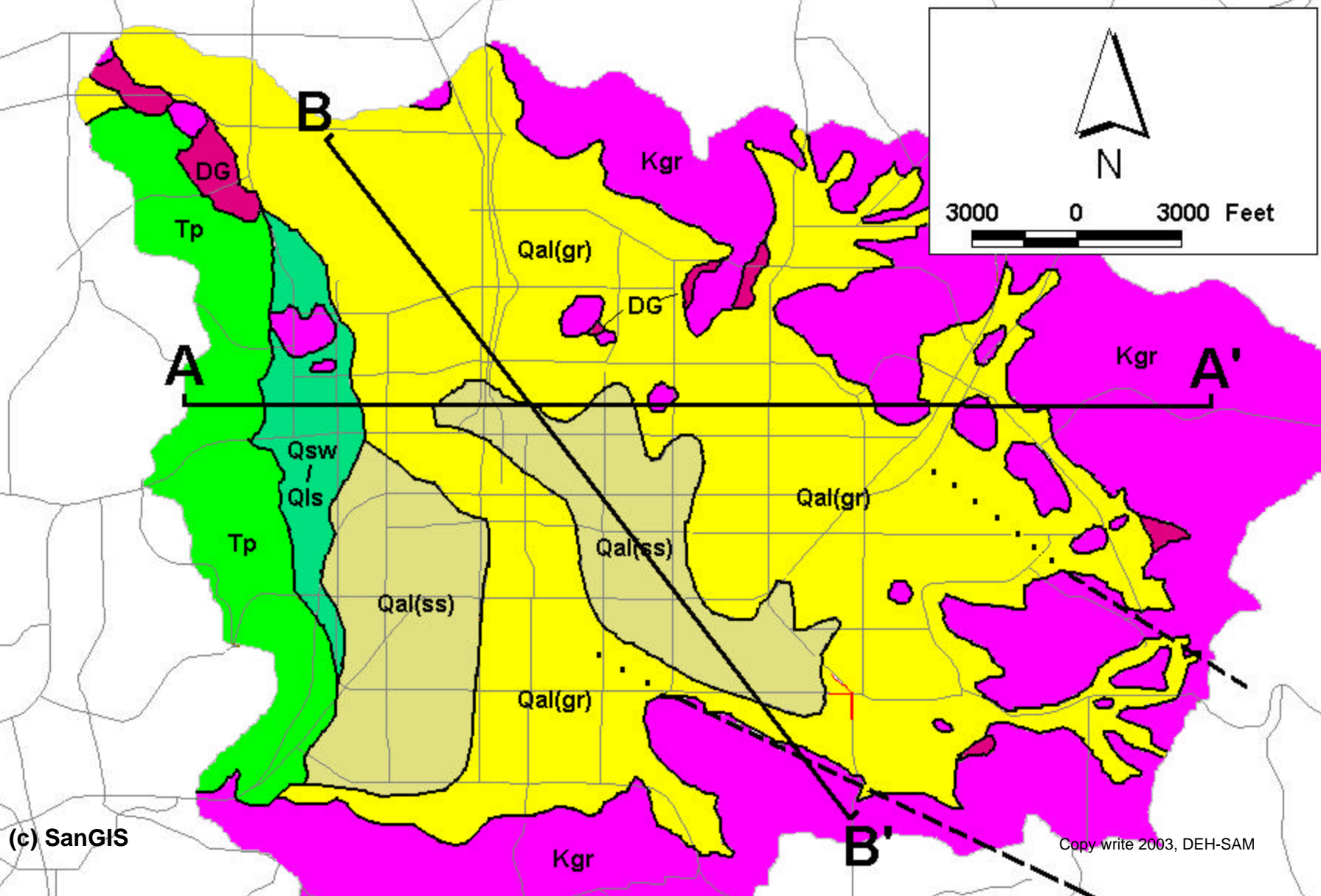
El Cajon Valley



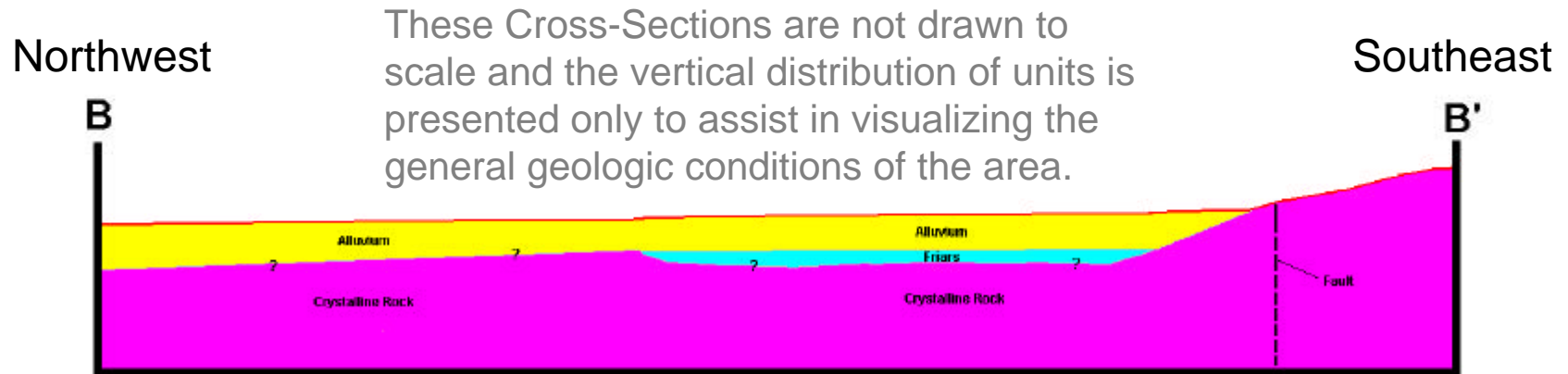
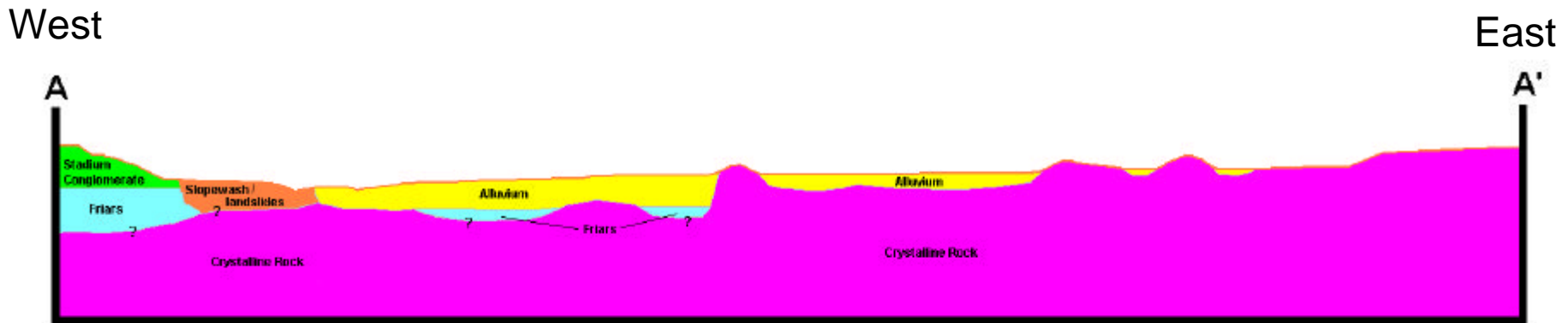
Geologic Map (DWR 1986)



Geologic Map (DWR 1986)



GENERALIZED GEOLOGIC CROSS-SECTIONS

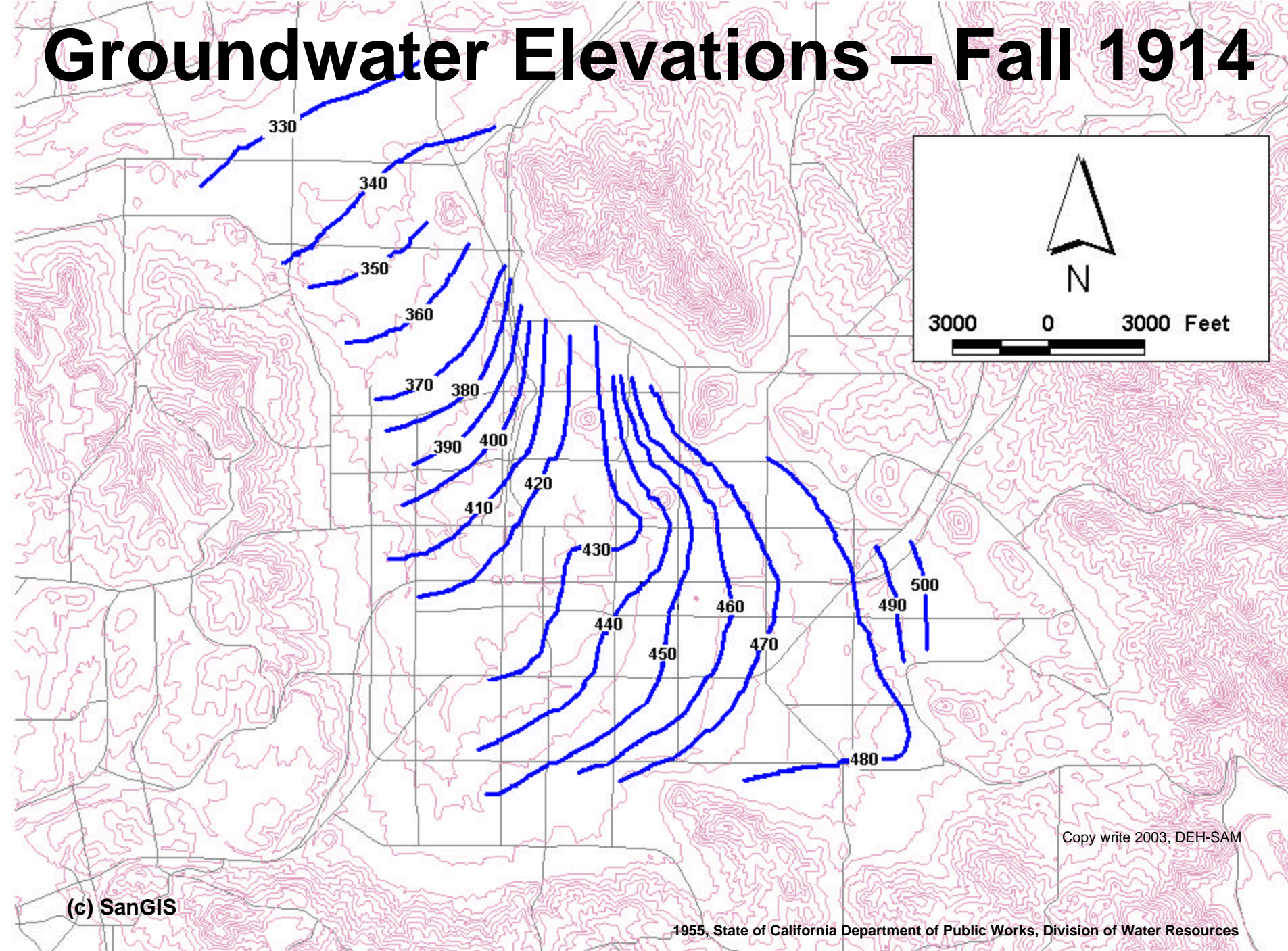


These Cross-Sections are not drawn to scale and the vertical distribution of units is presented only to assist in visualizing the general geologic conditions of the area.

Groundwater Development

- **Mid-1800s** - agricultural uses.
- **Early 1900s** - shift to mixed agricultural & domestic uses.
- **Mid-1900s** - the peak use of groundwater was reached within the basin.
- **Today** - Groundwater is being used for public, domestic and industrial supply

Groundwater Elevations – Fall 1914

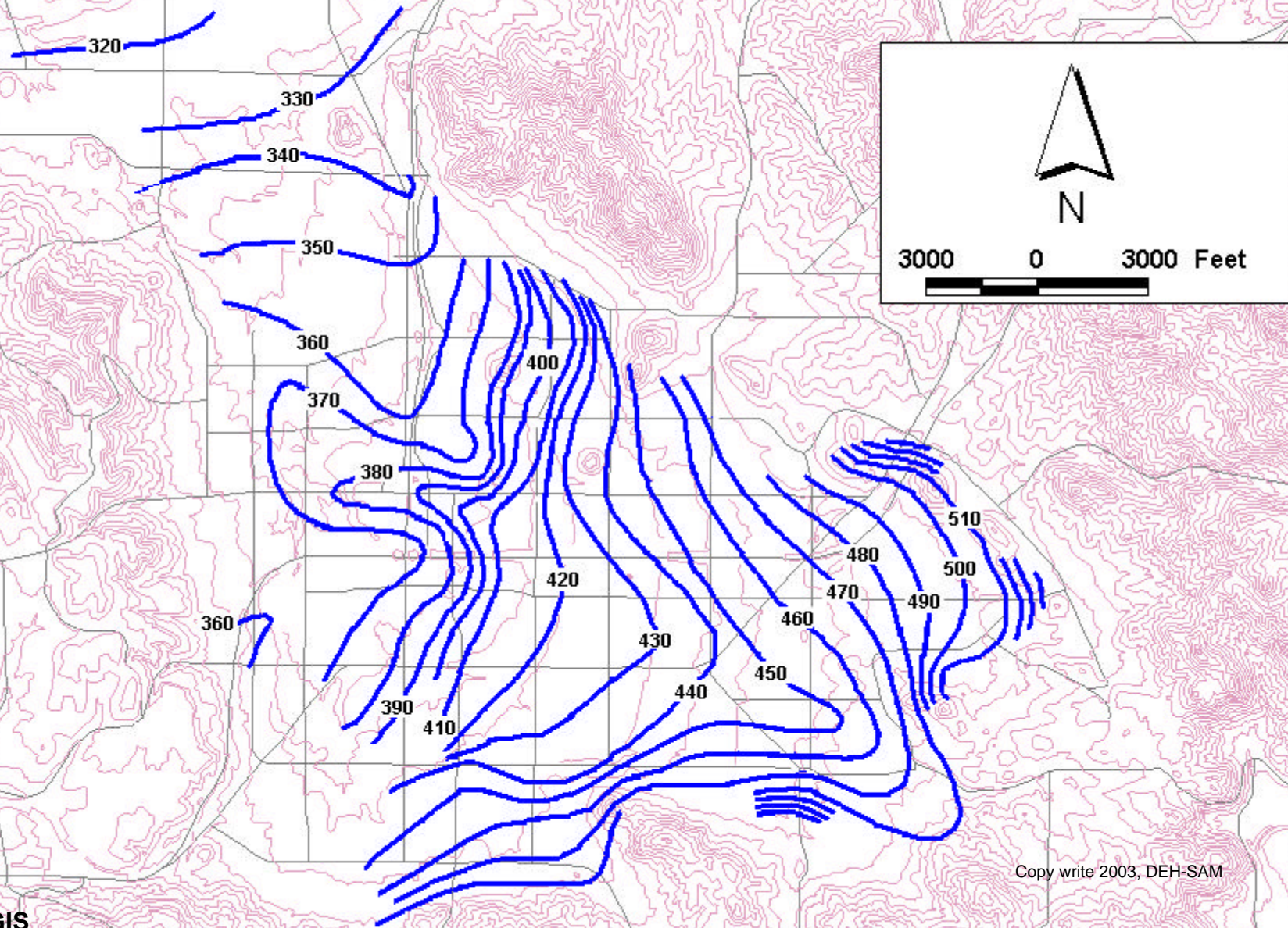


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1955, State of California Department of Public Works, Division of Water Resources

Groundwater Elevations – Fall 1952

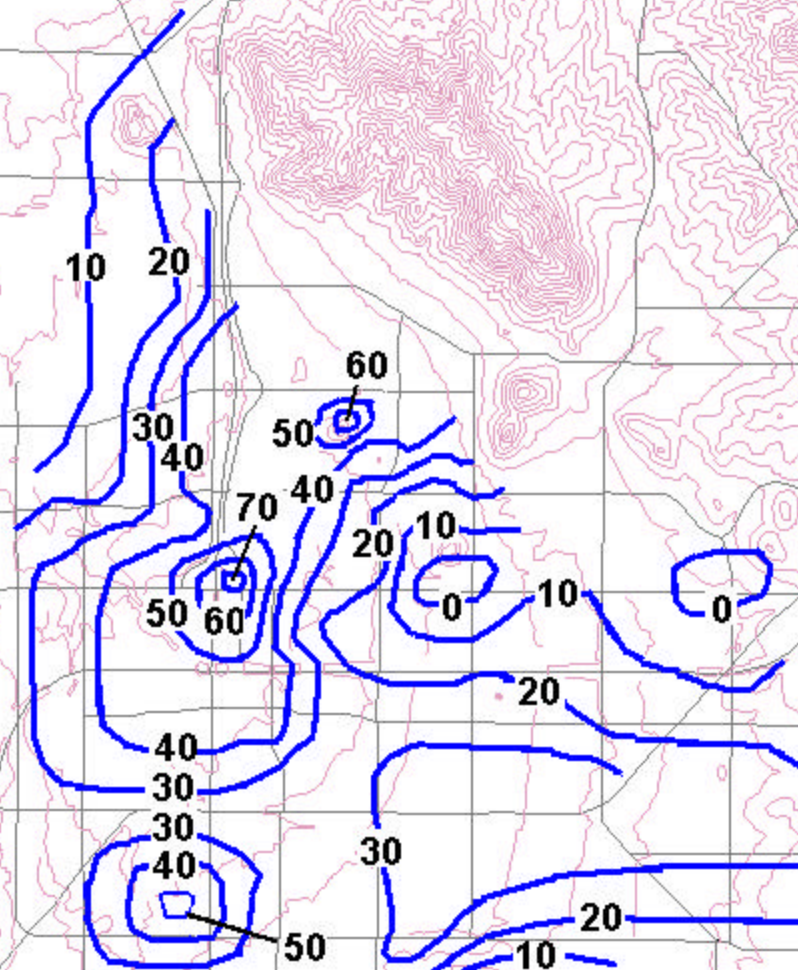


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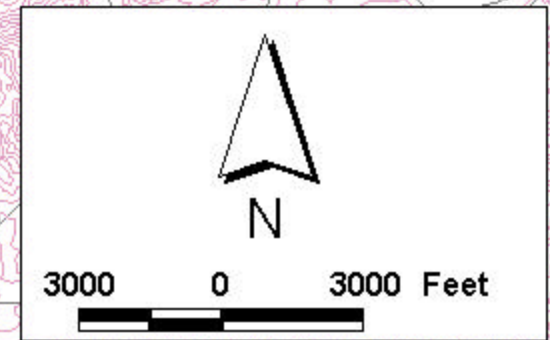
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1955, State of California Department of Public Works, Division of Water Resources

Drawdown 1914 to 1952



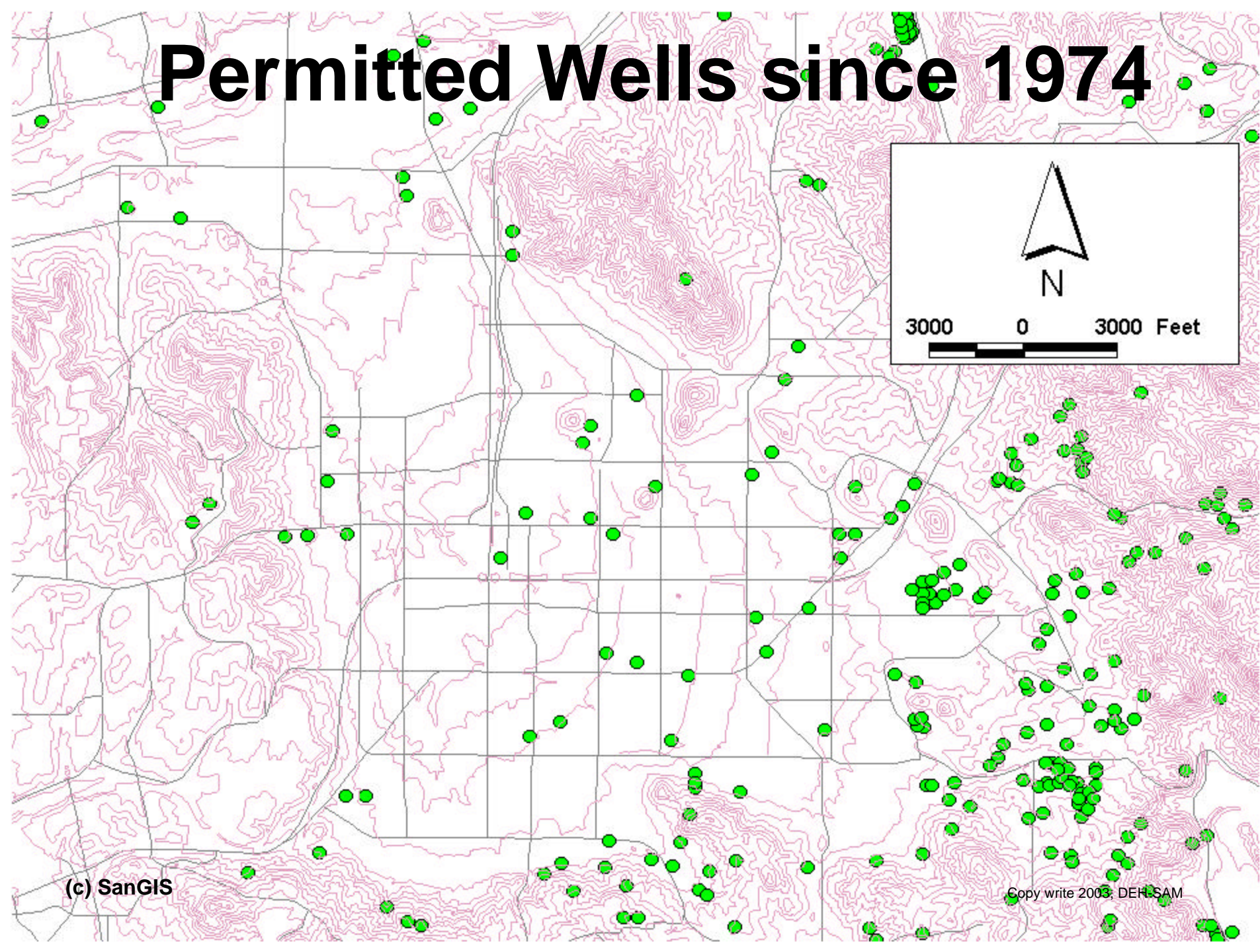
Groundwater Flow - 2000



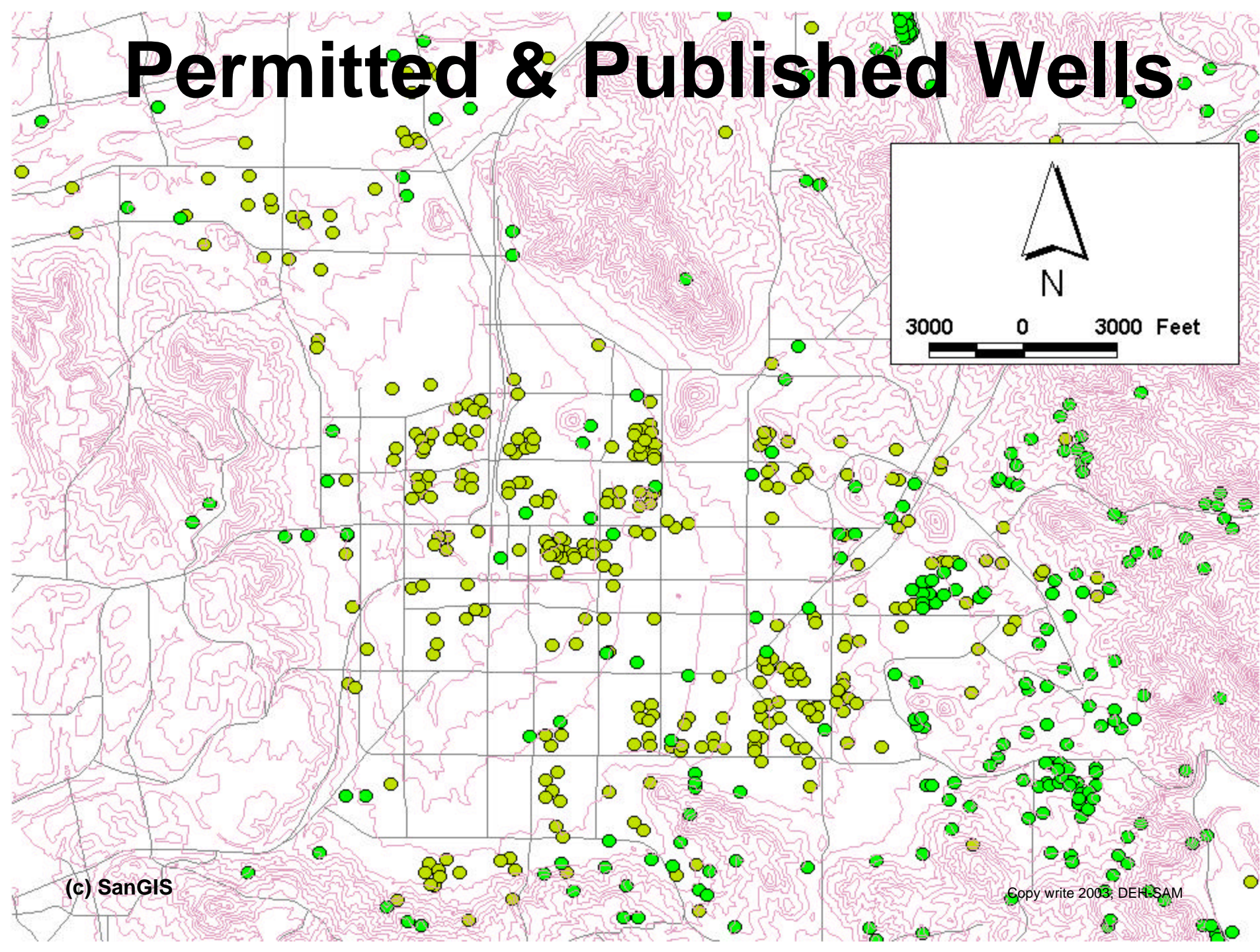
Supply Well Development

- **Permitted Supply Wells since 1974**
- **Permitted & Published Well**

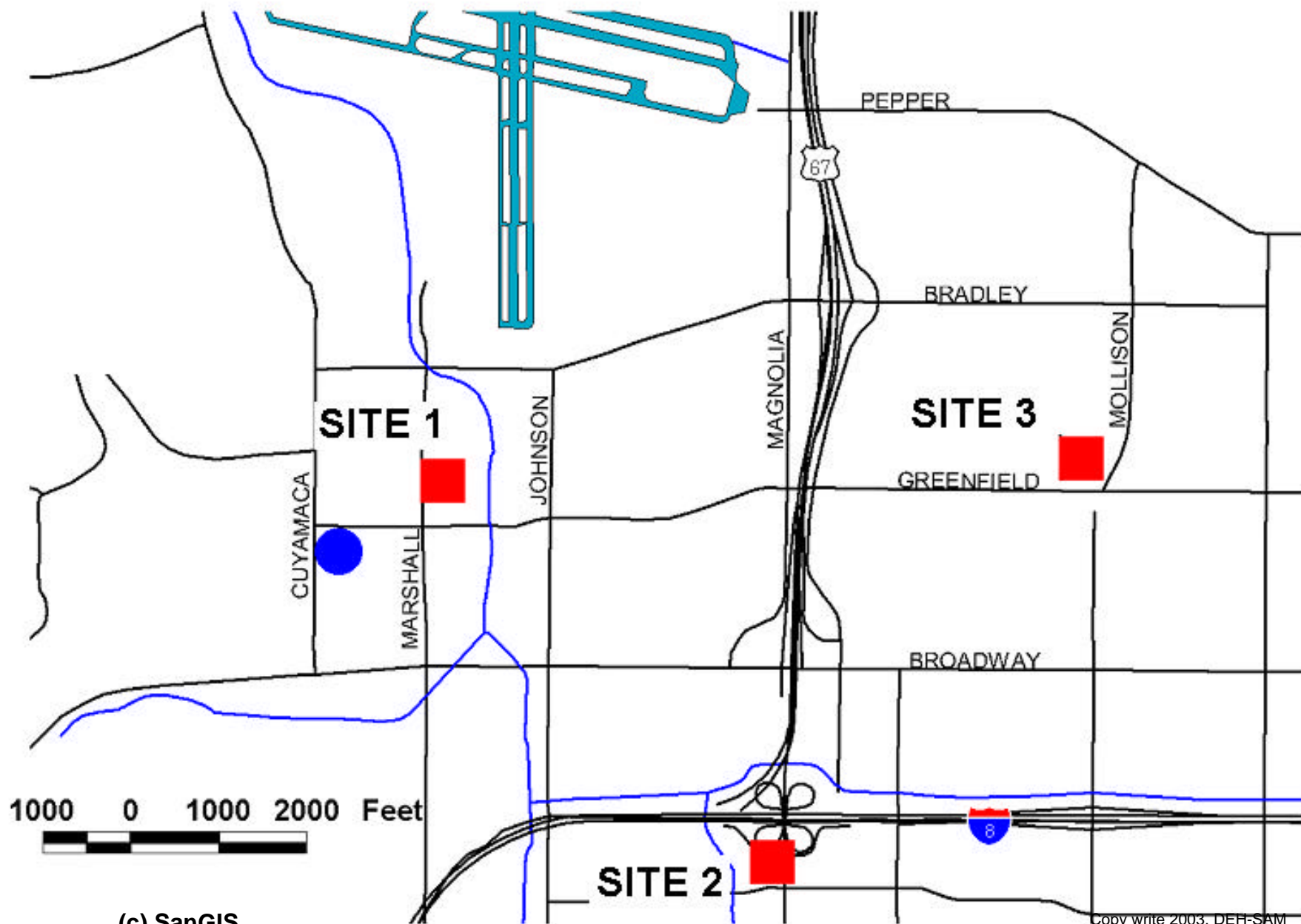
Permitted Wells since 1974



Permitted & Published Wells



General Observations



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Fletcher Well #4

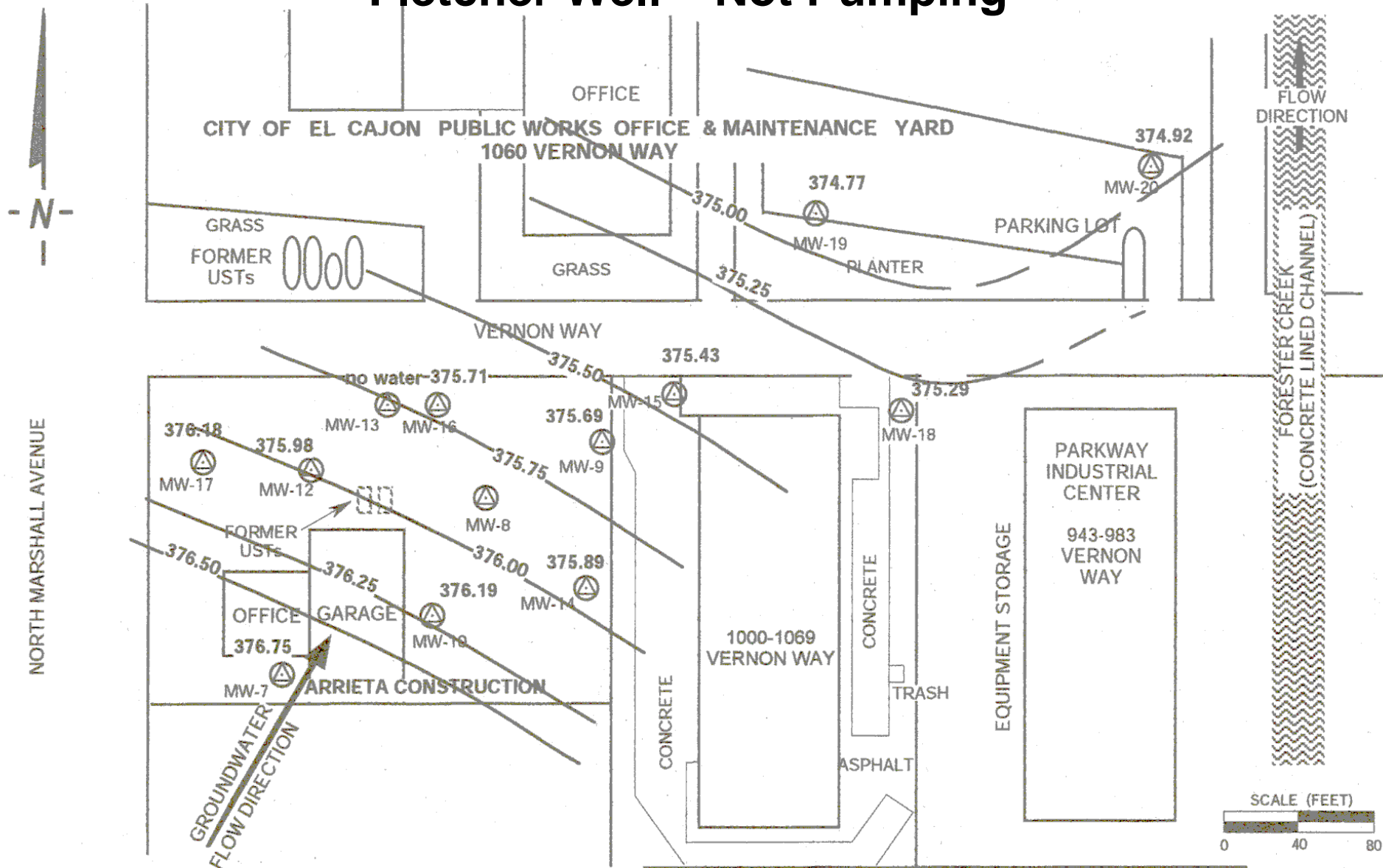
aka - San Diego #4 and El Cajon #4



- Drilled 1952 to 847 feet.
10" diameter, 91 ft casing
- Static water 31 ft
- PCE + TCE 15 ppb in pumped water
- New well drilled 1997 to 906 feet, 110 ft casing
- Static water 39 ft
- PCE + TCE 20 ppb in pumped water
- Pumps 250 gpm May to December

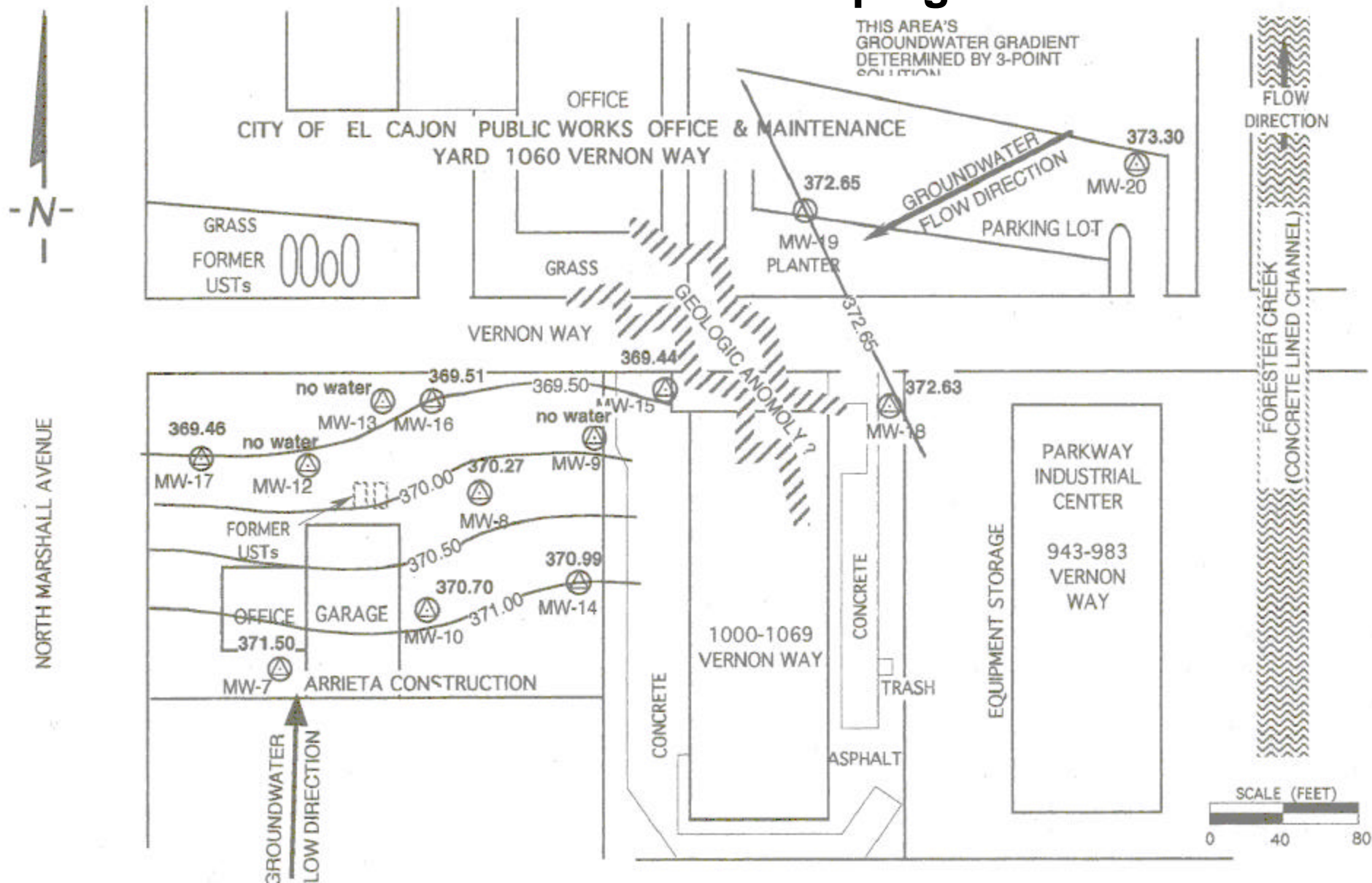
Site 1 – Groundwater

Fletcher Well – Not Pumping

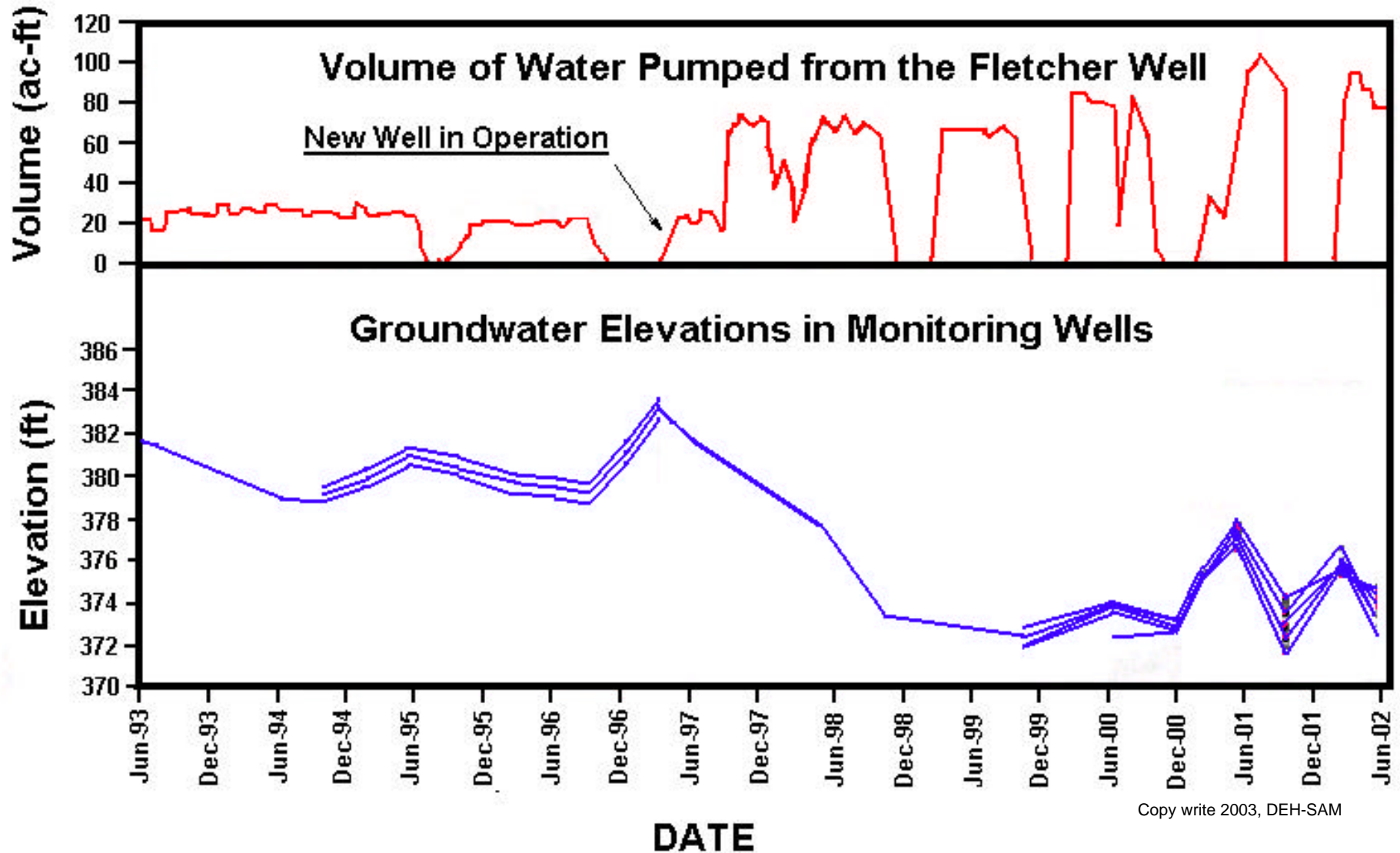


Site 1 – Groundwater

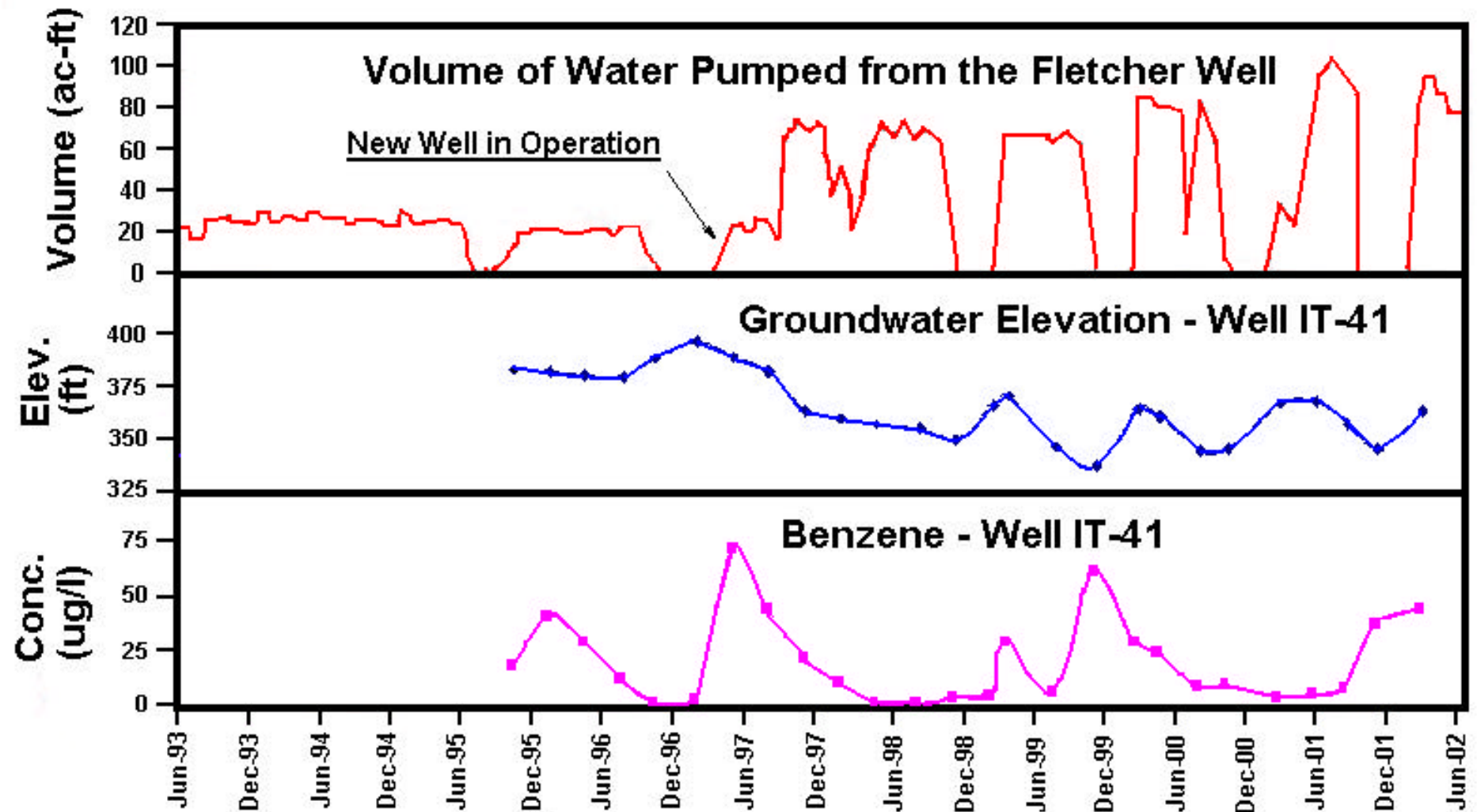
Fletcher Well – Pumping



Site 1 – GW Elevation vs Pumping



Site 2 – GW Elevation vs Pumping



Site 3

- **Waste solvents to 12 ft deep sump (1954 - 1983)**
- **Bottom of sump on DG at watertable**
- **5000 ft long TCE plume delineated 1998**
- **Transport in alluvium and DG**
- **Darcy Groundwater velocity is 180 ft/yr**
- **TCE velocity at least 110 ft/yr**

Site 3 - TCE Plume (1000 ppb TCE)



CONCLUSIONS

- Friars can produce perched zones, but is not contiguous across the valley
- If no Friars formation, expect rapid contamination of GW
- Shallow GW flow toward center of valley, then Northwest
- Horizontal GW velocity 150 ft/yr in alluvium and DG
- Pumping from fractured rock influences portions of shallow aquifer
- Shallow contamination drawn downward by pumping

SUGGESTIONS

- Distinguish alluvium, Friars and DG
- Use conventional geologic description of core materials
- Do not cross-connect lithologies with long well screens
- Be aware of GW flow velocity when spacing wells
- Check for production wells in area
- Watch monitoring data for cyclic changes in GW elevation